upward air current could also cause a succession of rises and falls of the hailstone, even though the upward air speed remained the same. At any rate, it is seen that variations in turbulence may be a factor in the vertical excursions of the hailstone.

LITERATURE CITED

(1) Humphreys, W. J.: The Uprush of Air Necessary to Sustain a Hailstone. Monthly Weather Review, vol. 56, 1928, p. 314.
(2) Giblett, M. A.: Line Squalls. Journal of the Royal Aeronautical Society, Great Britain, vol. 31, 1927, p. 528.
(3) Cowley, W. L., and Levy, H.: Aeronautics in Theory and Experiment. Edward Arnold, London, 1918. P. 90.
(4) Dryden, H. L., and Kuethe, A. M.: The Effect of Turbulence in Wind Tunnel Measurements. N.A.C.A. Technical Report No. 342, 1930.
(5) Bacon, D. L., and Reid, E. G.: The Resistance of Spheres in Wind Tunnels and in Air. N.A.C.A. Technical Report No. 185, 1924.
(6) Jacobs, E. N.: Sphere Drag Tests in the Variable Density Wind Tunnel. N.A.C.A. Technical Note No. 312, 1929, p. 8.
(7) Flachsbart, O.: Recent Researches on the Air Resistance of Spheres. N.A.C.A. Technical Memorandum No. 475, 1928. Translation from Physikalische Zeitschrift, vol. 28, 1927.

A BRILLIANT METEOR AND ITS CLOUD-LIKE TRAIL

By S. P. PETERSON
[Weather Bureau, Albuquerque, N.Mex., Mar. 24, 1933]

An unusually brilliant meteor was observed at 5:07 a.m on March 24, 1933, by Pilot C. W. Coyle, while flying a Transcontinental & Western Air Mail plane east from Albuquerque. At the time in question he was near Adrian, Tex., 235 miles east of Albuquerque, at a sea-level altitude of about 9,500 feet. At first it appeared as if a plane had suddenly turned on a landing light to the east of, and at an angular elevation of about 60° from, his position.

The meteor passed to the northward, seemingly at about his level, and looked like a ball of fire with pieces bursting from it, and left in its wake a great red trail tinged with blue. It disappeared to the westward and seemed to strike the earth, or disintegrate, northeast of Tucumcari, N.Mex.

The meteor also was seen by Pilot F. E.Williams when he was over Acomita, N.Mex., some 55 miles west of Albuquerque, flying a Transcontinental & Western Air Mail plane westward. Suddenly the sky was brilliantly illuminated, and on looking for the cause he saw the meteor behind him at an indefinite distance. It also was seen by several persons in Albuquerque. A very luminous cloud of bluish-green color, apparently developed by the meteoric dust, seemed to be suspended in the sky to the east-northeast of Albuquerque over the Sandia Mountains. This cloud remained visible until lost in the light of dawn. It seems that there was some electric development in the atmosphere along the passage of the meteor, as Pilot Coyle said that the radio beam that he was following at the time was cut out by a roar of static. There was much haziness over eastern New Mexico, southeastern Colorado, and the Texas Panhandle the latter part of the 24th, practically all the 25th, and locally in those sections early on the 26th. Whether this was owing to meteoric dust or to other causes is not known. The visibility at Dilia, N.Mex., and at Tucumcari, N.Mex., was reduced to one-half mile at the time of the greatest density of the haze. This meteor attracted the Nation-wide interest of scientists, who have made an extended search for its location.

The accompanying photograph of this meteor cloud was taken at 5:30 a.m. The camera was facing toward the east and the luminous cloud was apparently resting on the crest of the Sandia Mountains. There were a few scattering stratus and strato-cumulus clouds but these were still in the shadow of the earth, while the meteor cloud was in full sunshine, as shown in the picture.

When first seen by the photographer, the luminous cloud, looking like a magnesium flare, was midway between the top of the picture and the crest of the mountains, but it gradually settled, while he was preparing his camera, to the position in which it is here shown.

TROPICAL DISTURBANCES OF JULY 1933

By CHARLES L. MITCHELL

June 27–July 6.—This disturbance was first noted the evening of June 27, central in about latitude 9° north and longitude 59° west. It was the earliest known in that general area and also the only one in a record of nearly 50 years to pass south of the Island of Trinidad and over the northeastern corner of Venezuela. On the morning of June 28 the center was over the southwestern part of the Gulf of Paria. An Associated Press dispatch from Port of Spain, estimated that in the Island of Trinidad there were 13 deaths, 1,000 persons rendered homeless, about $3,000,000 property damaged, practically all in the southern part of the island.

Through the courtesy of the United States Chargé d'Affaires at Caracas, Venezuela, the following report has been received:

Hurricanes in eastern Venezuela.—On June 28 a devastating hurricane swept through eastern Venezuela, the towns of Carúpano and Rio Caribe, on the mainland, and the island of Margarita suffering the most damage. Telephonic and telegraphic communications were cut for several days. Many business houses and private dwellings were destroyed, several small trading and fishing boats sunk and a number of lives lost. The losses from this hurricane alone are estimated at several millions of bolivars [1 bolivar= 19.3 cents]. During July there were several more hurricanes in the vicinity of Pedernales, at the mouth of the Orinoco, and along the river itself up as far as the Apure. However, most of them did not strike towns of any size.

During the next several days this disturbance moved first west-northwestward and later northwestward over the Caribbean Sea. It passed over extreme western Cuba the night of July 2–3, but did not cause much damage. By the morning of the 4th a strong area of high pressure, that spread southward from Hudson Bay over the eastern part of the United States, blocked the northward progress of this disturbance and deflected it toward the west. After moving westward until the evening of the 5th it turned southwestward and crossed the Mexican coast line about midway between Tampico and Brownsville, Tex., the evening of the 6th, where it caused several deaths and considerable property damage in the sparsely-settled coast region.

The usual twice-daily advisory warnings were issued in connection with this disturbance. Northeast storm warnings were ordered at noon of the 5th from Brownsville to Port O'Connor, Tex., and the warnings at Browns-